



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of: Shuichi TAKAMIYA

Serial No. 10/663,846

Group Art Unit: 1752

Filed: September 17, 2003

Examiner: Chea, Thorl

For: METHOD OF MAKING
LITHOGRAPHIC PRINTING PLATE

DECLARATION UNDER 37 CFR 1.132

Honorable Commissioner of
Patents and Trademarks
Washington, DC 20231

Sir:

1. I, Senzou Sasaoka, declare and state as follows;
2. I graduated from the Master's course of Osaka University, faculty of Engineering, in 1975.
3. I was employed by Fuji Photo Film Co., Ltd. in April 1975. I was employed at Ashigara Laboratory of said company and engaged in research on graphic arts materials and chemicals from 1975 to April of 2002. I have been employed at Yoshidaminami Laboratory of said Company since April of 2002, where I have been engaged in research on pressroom chemicals.
4. I have reviewed the official Action dated August 9, 2005, concerning the above-identified application and have noted the Examiner's allegation that the pending claims 1-2 and 4-14 of the present application would be rendered obvious over EP 1182512 (EP'512), EP 1211065 (EP'065) and Publication Number JP 2000-321788 (PN'788).

5. To demonstrate the superiority of the plate making process according to the present invention of the above-identified application to the prior art, the following comparative experiments were carried out by me or under my direct supervision.

EXPERIMENT

[Comparative Examples 1-7 and Examples 1 and 2]

Embodiments in Comparative Examples 1-7 and Examples 1 and 2 are summarized in the following table.

	Lithographic printing plate precursor	Developing solution
Comparative Example 1	EP'065, paragraph [0180]-[0181]: "planographic printing plate precursor 1"	DT-1 (Fuji Film Co., Ltd.) diluted 1:8 with tap water
Comparative Example 2	EP'065, paragraphs [0180]-[0181]: "planographic printing plate precursor 1"	DP-4 (Fuji Film Co., Ltd.) diluted 1:8 with tap water
Comparative Example 3	EP'065, paragraph [0213]: "planographic printing plate precursor 21" consisting of two recording layers	DT-1 (Fuji Film Co., Ltd.) diluted 1:8 with tap water
Comparative Example 4	PN'788, the printing plate precursor used in Examples	comprising ethylenediamine 20EO adduct
Comparative Example 5	PN'788, the printing plate precursor used in Examples	comprising ethylenediamine 20EO adduct
Comparative Example 6	EP'512, the printing plate precursor used in Examples	comprising an amphoteric surfactant
Comparative Example 7	EP'512, the printing plate precursor used in Examples	comprising a cationic surfactant
Example 1	the present application, the printing plate precursor used in Examples, having two-layered structure	the present application, Developing solution No. 46 comprising compound (C) (20EO)
Example 2	the present application, the printing plate precursor used in Example, having two-layered structure	the present application, Developing solution No.126, comprising compound (C) (20EO)

Lithographic printing plate for Comparative Examples 1 and 2

An aluminum support obtained by the procedure described in the present application's text, on page 66, line 17 to page 67, line 9, was coated with the following sensitizing solution 1 at a coated amount of 1.0 g/m², and dried at 140°C for 50 seconds to obtain a lithographic printing plate.

Sensitizing Solution:

• Ammonium salt (1) (see EP'065, page 6)	0.04g
• m, p-cresol novolac	0.474g
(m/p ratio=6/4, weight average molecular weight 3500, containing 0.5% by weight of unreacted cresol)	
• A specific copolymer 1 described in JP-A No. 11-288093	2.37g
• Cyanine dye A	0.155g
• 2-methoxy-4-(N-phenylamino)benzene diazonium hexafluorophosphate	0.03g
• Tetrahydrophthalic anhydride	0.19g
• Ethyl violet in which a counterion thereof is changed to 6-hydroxy- β -naphthalenesulfonic acid	0.05g
• Fluorine containing surfactant (Megafac F 176PF, manufactured by Dainippon Ink and Chemicals, Inc.)	0.035g
• Fluorine containing surfactant (Megafac MCF-312, manufactured by Dainippon Ink and Chemicals, Inc.)	0.05g
• Paratoluene sulfonic acid	0.008g
• Bis-p-hydroxyphenylsulfone	0.063g
• Dodecyl stearate	0.06g
• γ -butyrolactone	13g
• Methyl ethyl ketone	24g
• 1-methoxy-2-propanol	11g

Lithographic printing plate for Comparative Example 3

The support used in Comparative Example 1, was coated with the following coating solution of a lower layer at an amount of 0.85g/m², and dried at 140°C for 50 seconds. Thereafter, a coating solution of an upper layer was coated at an amount of 0.27 g/m², and dried at 120°C for 1 minute, to obtain two-layered structure.

[Coating solution for Lower layer]

• N-(4-aminosulfonylphenyl)methacrylamide/acrylonitrile/ methyl methacrylate (36/34/30: weight average molecular weight 50,000)	1.896g
• Cresol novolac (m/p ratio=6/4, weight average molecular weight 4500, remaining monomer 0.8wt%)	0.237g
• Cyanine dye A	0.109g
• 4,4'-bishydroxyphenylsulfone	0.063g
• Tetrahydrophthalic anhydride	0.190g
• p-toluene sulfonic acid	0.008g
• Ethyl violet in which a counterion thereof is changed to 6-hydroxy- β -naphthalenesulfonic acid	0.05g
• Fluorine containing surfactant (Megafac F176, manufactured by Dainippon Ink and Chemicals, Inc.)	0.035g
• Methyl ethyl ketone	26.6g
• 1-methoxy-2-propanol	13.6g
• γ -butyrolactone	13.8g

[Coating solution for Upper layer]

• m,p-cresol novolac (m/p ratio=6/4, weight average molecular weight 4500, containing 0.8% by weight of unreacted cresol)	0.237g
• Cyanine dye A	0.047g
• Dodecyl stearate	0.060g
• 3-methoxy-4-diazodiphenylamine hexafluorophosphate	0.030g
• Fluorine containing surfactant (Megafac F176, manufactured by Dainippon Ink and Chemicals, Inc.)	0.110g
• Fluorine containing surfactant (Megafac MCF-312 (30%), manufactured by Dainippon Ink and Chemicals, Inc.)	0.120g
• Methyl ethyl ketone	15.1g
• 1-methoxy-2-propanol	7.7g

Lithographic printing plate for Comparative Examples 4 and 5

An aluminum support obtained by the procedure described in the

present application's text, on page 66, line 17 to page 67, line 9, was coated with the following coating solution at an amount of 1.8g/m², and dried to obtain a lithographic printing plate precursor.

Coating solution

• m,p-Cresol novolac	1.0g
(m/p ratio=6/4, weight-average molecular weight of 8,000, comprising 0.5% by weight of unreacted cresol)	
• Cyanine dye A	0.1g
• Phthalic anhydride	0.05g
• P-toluene sulfonic acid	0.002g
• Ethylviolet	0.02g
(counter ion: 6-hydroxy- β -naphthalene sulfonic acid)	
• Esterified product of	0.01g
1,2-diazonaphthoquinone-5-sulfonyl chloride and pyrogallol/acetone resin	
• Fluorine atom-containing surfactant	0.05g
(trade name of F-177 manufactured by Dainippon Ink and Chemicals, Inc.)	
• Methyl ethyl ketone	8g
• 1-Methoxy-2-propanol	4g

Lithographic printing plate for Comparative Examples 6 and 7

An aluminum support obtained by the procedure described in the present application's text, on page 66, line 17 to page 67, line 9, was coated with the following coating solution at the amount of 1.8g/m², and dried to obtain a lithographic printing plate precursor.

Coating solution

• Specific copolymer prepared by	0.4g
the procedure described in EP'512, paragraphs [0218]-[0219]	
• m,p-Cresol novolac	0.6g
(m/p ratio=6/4, weight-average molecular weight of 8,000, comprising 0.5% by weight of unreacted cresol)	
• Cyanine dye A	0.1g
• Phthalic anhydride	0.05g
• P-toluene sulfonic acid	0.002g
• Ethylviolet	0.02g

(counter ion: 6-hydroxy- β -naphthalene sulfonic acid)	
• Esterified product of 1,2-diazonaphthoquinone-5-sulfonyl chloride and pyrogallol/acetone resin	0.01g
• Fluorine atom-containing surfactant (trade name of F-177 manufactured by Dainippon Ink and Chemicals, Inc.)	0.05g
• Methyl ethyl ketone	8g
• 1-Methoxy-2-propanol	4g

Lithographic printing plate precursor for Examples 1 and 2

An aluminum support obtained by the procedure described in the present application's text, on page 66, line 17 to page 67, line 9, was coated with coating solutions as described in the text, on page 70, line 1 to page 71, line 28, to obtain two-layer structure of a lower layer at an amount of 0.85g/m², and an upper layer at amount of 0.2 g/m².

[Coating solution for Lower layer]

• Copolymer having carboxyl groups (Text, page 68, line 11-17, Synthesis Example 2)	0.050g
• Copolymer having carboxyl groups (Text, page 69, lines 11-22, Synthesis Example 4)	0.050g
• N-(4-Aminosulfonylphenyl)methacrylamide/ acrylonitrile/methyl methacrylate (36/34/30, weight-average molecular weight of 50,000)	1.896g
• Cresol novolac (m/p ratio=6/4, weight-average molecular weight of 4,500, comprising 0.8% by weight of unreacted monomer)	0.237g
• Cyanine dye A	0.109g
• 4,4'-Bishydroxyphenylsulfone	0.063g
• Tetrahydrophthalic anhydride	0.190g
• P-toluene sulfonic acid	0.008g
• Ethylviolet (counter ion: 6-hydroxy- β -naphthalene sulfonic acid)	0.05g
• Fluorine atom-containing surfactant (trade name of F-176 manufactured by Dainippon Ink and Chemicals, Inc.)	0.035g

· Methyl ethyl ketone	26.6g
· 1-Methoxy-2-propanol	13.6g
· γ -butyrolactone	13.8g
[Coating solution for Upper layer]	
· Copolymer having carboxyl groups (Text, page 68, line 11-17, Synthesis Example 2)	0.050g
· Copolymer having carboxyl groups (Text, page 69, lines 11-22, Synthesis Example 4)	0.050g
· Cresol novolac (m/p ratio=6/4, weight-average molecular weight of 4,500, comprising 0.8% by weight of unreacted monomer)	0.237g
· Cyanine dye A	0.047g
· Dodecyl stearate	0.060g
· 3-Methoxy-4-diazodiphenylamine hexafluorophosphate	0.030g
· Fluorine atom-containing surfactant (trade name of F-176 (20% solution) manufactured by Dainippon Ink and Chemicals, Inc.)	0.110g
· Fluorine atom-containing surfactant (trade name of MCF312F (30% solution) manufactured by Dainippon Ink and Chemicals, Inc.)	0.12g
· Methyl ethyl ketone	15.1g
· 1-Methoxy-2-propanol	7.7g

Developing solutions used in Comparative Examples 1-7 and Examples 1 and 2

[Comparative Examples 1 and 3]

DT-1: An alkaline developing solution free from a silicate

[Comparative Example 2]

DP-4: An alkaline developing solution comprising a silicate

[Comparative Example 4]

A SiO₂-containing alkaline developing solution comprising potassium silicate (molar ratio of SiO₂/K₂O=1.1) at 4.0wt% and ethylenediamine 20EO adduct at 1.0wt%

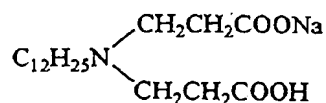
[Comparative Example 5]

A nonreducing sugar-containing alkaline developing solution comprising D-sorbitol potassium salt at 5.0wt% and ethylenediamine 20EO adduct

at 1.0wt%

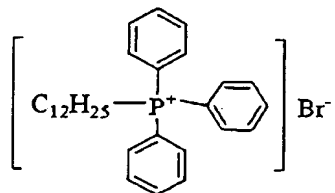
[Comparative Example 6]

A SiO₂-containing alkaline developing solution comprising potassium silicate (molar ratio of SiO₂/K₂O=1.1) at 4.0wt% and the following amphoteric surfactant at 1.0g/litre



[Comparative Example 7]

A SiO₂-containing alkaline developing solution comprising potassium silicate (molar ratio of SiO₂/K₂O=1.1) at 4.0wt% and the following cationic surfactant at 1.0g/litre



[Example 1]

A SiO₂-containing alkaline developing solution comprising potassium silicate (molar ratio of SiO₂/K₂O=1.1) at 4.0wt% and ethylenediamine 20EO adduct (compound (C) in Text, on page 16) at 1.0g/litre

[Example 2]

A nonreducing sugar-containing alkaline developing solution comprising D-sorbitol potassium salt at 5.0wt% and ethylenediamine 20EO adduct (compound (C) in Text, on page 16) at 1.0g/litre

Light-Exposure and Development

In each of Comparative Examples 1-7 and Examples 1-2, the printing plate precursor was treated by the procedure described in the present application's text, on page 78, line 3 to page 79, line 6, using the developing solution at a development temperature of 30°C for 12

seconds.

More specifically, the printing plate precursor was light-exposed using a semiconductor laser with an output power of 500mW, a wave length of 830nm and a beam diameter of $17\mu\text{m}(1/e^2)$ at a horizontal scanning speed of 5m/sec, and maintained at 25°C. The plate thus treated was processed by an automatic processor, PS900NP (manufactured by Fuji Photo Film Co., Ltd.) filled up with the above each developing solution, at a development temperature of 30°C for 12 seconds. After the development procedure, the plate was washed with water and treated with a gum solution (two-fold dilution of GU-7 manufactured by Fuji Photo Film Co., Ltd.) so as to obtain a lithographic printing plate.

Evaluation of Printing Durability

The obtained lithographic printing plate was subjected to printing process using LITHRONE printing machine manufactured by Komori Corporation and GEOS(N) Black ink manufactured by Dainippon Ink and Chemicals, Inc., and printing durability was evaluated by observing the number of printed matter when a density of solid image became to visually fade. The higher number of printed matter is evaluated as higher printing durability.

Evaluation of Sensitivity

Sensitivity was evaluated by the procedure described in EP'065, paragraph [0220]. Specifically, a test pattern image was formed on the each printing plate precursor of Comparative Examples 1-7 and Examples 1-2 by varying the exposure energy with Trendsetter manufactured by Creo Products Inc. Thereafter, the plate was developed with each developing solution. Minimum value of the exposure energy at which an exposed portion can be developed with the developing solution was measured, and the value indicates the sensitivity. The smaller value is evaluated to have higher sensitivity.

Results

Results of the evaluations on printing durability and sensitivity are shown below.

	Embodiment	Printing durability (myriad)	Sensitivity (mJ/cm ²)
Comparative Example 1	EP'065	5.5	65
Comparative Example 2	EP'065	6.0	60
Comparative Example 3	EP'065, two recording layers	5.0	72
Comparative Example 4	PN'788	5.5	85
Comparative Example 5	PN'788	6.0	73
Comparative Example 6	EP'512	6.5	70
Comparative Examples 7	EP'512	6.0	78
Example 1	the present invention	13.0	55
Example 2	the present invention	13.5	53

As seen from the above results of the experiments, the lithographic printing plate obtained by the method of the present invention can exhibit remarkably higher printing durability compared with the lithographic printing plate obtained by the method of the prior art, and simultaneously the method of the present invention can attain a higher sensitivity compared with the method disclosed in the prior art.

These advantages obtained by the present invention would be remarkable and unpredictable from the prior art.

I therefore believe that the present invention would be patentable over EP 1182512 (EP'512), EP 1211065 (EP'065) and Publication Number JP 2000-321788 (PN'788).

I declare further that all statement made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful, false statements are the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful, false statements may jeopardize the validity of the application or any patent issuing thereon.

FURTHER, DECLARANT SAYETH NOT

Date: December 5, 2005

Senzou Sasaoka
Senzou Sasaoka